Amendments to the Claims

1-22. (Cancelled)

23. (New) A modem for communicating in real-time between a computer and a remote device via a communications link, the computer having a host processor and a memory, the remote device operating at a remote baud rate, the modem comprising, in combination:

a telephone interface circuit connectable to the communications link for (i) receiving from the communications link an incoming signal representative of a communication from a remote device and (ii) delivering to the communications link an outgoing signal representative of a communication from the computer;

an interpolation routine executable by the host-processor to interpolate a stream of incoming digital sample values representative of the incoming signal into a modified stream of incoming digital sample values substantially synchronized to the remote baud rate;

a modem demodulation routine executable by the host-processor to translate the modified stream of incoming digital sample values into digital input data; and

a modem modulation routine executable by the host-processor to translate digital output data into digital sample amplitude values representative of the outgoing signal.

24. (New) A modem as claimed in claim 23, wherein the telephone interface circuit includes a hybrid circuit having a bidirectional port for receiving the incoming signal and for delivering the outgoing signal.

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25. (New) A modem as claimed in claim 23, wherein the interpolation routine, the modem demodulation routine and the modem modulation routine are stored in the memory.

26. (New) A modem as claimed in claim 23, wherein the interpolation routine, the modem demodulation routine and the modem modulation routine each comprise, respectively, a set of machine language instructions executable by the host processor.

27. (New) A modem as claimed in claim 23, further comprising a tone-dialing routine executable by the host-processor for generating a sequence of outgoing digital sample values representing a sequence of dual-tone signals for establishing a dial-up connection with the remote device.

28. (New) A modem as claimed in claim 27, wherein the tone-dialing routine is stored in the memory.

29. (New) A modem as claimed in claim 23, further comprising an answer-tone detection routine executable by the host processor for processing the incoming digital sample values to detect the presence of an answer tone received over the communications link.

30. (New) A modem as claimed in claim 29, wherein the answer-tone detection routine is stored in the memory.

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31. (New) A modem as claimed in claim 23, wherein the incoming signal comprises graphical data.

32. (New) A modem as claimed in claim 23, wherein the outgoing signal comprises graphical data.

33. (New) A modem for communicating in real-time between a computer and a remote device via a communications link, the computer having a host processor and a memory, the modem comprising, in combination:

a telephone interface circuit connectable to the communications link for (i) receiving from the communications link an incoming signal representative of a communication from a remote device and (ii) delivering to the communications link an outgoing signal representative of a communication from the computer;

a modem demodulation routine executable by the host-processor to demodulate a stream of interpolated digital sample amplitude values representative of the incoming signal, and to thereby provide a stream of digital input data; and

a modem modulation routine executable by the host-processor to modulate a stream of digital output data, and to thereby provide a stream of digital sample amplitude values representative of the outgoing signal.

34. (New) A modem as claimed in claim 33, wherein the telephone interface circuit includes a hybrid circuit having a bidirectional port for receiving the incoming signal and for delivering the outgoing signal.

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35. (New) A modem as claimed in claim 33, wherein the modem demodulation routine and modem modulation routine are both stored in the memory.

36. (New) A modem as claimed in claim 33, wherein the modem demodulation routine and modem modulation routine each comprise, respectively, a set of machine language instructions executable by the host processor.

37. (New) A modem as claimed in claim 33, further comprising a call-answering routine executable by the host processor when the incoming signal represents an analog voice signal from a remote caller, for transmitting an acknowledgement signal over the communications link and for recording an incoming message received over the communications link.

38. (New) A modem as claimed in claim 33, further comprising a tone-dialing routine executable by the host-processor for generating a sequence of outgoing digital sample amplitude values representing a sequence of dual-tone signals for establishing a dial-up connection with the remote device.

39. (New) A modem as claimed in claim 33, further comprising an answer-tone detection routine executable by the host processor for processing the incoming digital sample amplitude values to detect the presence of an answer tone received over the communications link.

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40. (New) A system for communicating in real-time between a computer and a remote device via a communications link, the computer having a host processor and a memory, the remote device operating at a remote baud rate, the system comprising, in combination:

line interface circuitry connectable to the communications link for (i) receiving from the communications link an incoming signal representative of a communication from a remote device and (ii) delivering to the communications link an outgoing signal representative of a communication from the computer;

an interpolation routine executable by the host-processor to interpolate a stream of digital sample values representative of the incoming signal so as to compensate for baud rate variation and to thereby provide an interpolated stream of digital sample values;

a modem demodulation routine executable by the host-processor to demodulate the interpolated stream of digital sample values, and to thereby provide a stream of digital input data; and

a modem modulation routine executable by the host-processor to modulate a stream of digital output data, and to thereby provide a stream of digital sample values representative of the outgoing signal.

41. (New) A system as claimed in claim 40, further comprising conversion circuitry for converting the incoming signal to the stream of digital sample values representative of the incoming signal, at a sampling rate synchronized to a local clock signal.

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42. (New) A system as claimed in claim 40, wherein the line interface circuitry includes a hybrid circuit having a bidirectional port for receiving the incoming signal and for delivering the outgoing signal.

43. (New) A system as claimed in claim 40, wherein the interpolation routine, the modem demodulation routine and the modem modulation routine are stored in the memory.

44. (New) A system as claimed in claim 40, wherein the interpolation routine, the modem demodulation routine and the modem modulation routine each comprise, respectively, a set of machine language instructions executable by the host-processor.

45. (New) A system as claimed in claim 40, wherein the interpolation routine is executable by the host-processor to compensate for timing difference between sample rates of the computer and the remote device.

46. (New) A system as claimed in claim 40, further comprising a tone-dialing routine executable by the host-processor for generating a sequence of outgoing digital sample values representing a sequence of dual-tone signals for establishing a dial-up connection with the remote device.

47. (New) A system as claimed in claim 46, wherein the tone-dialing routine is stored in the memory.

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48. (New) A system as claimed in claim 40, further comprising an answer-tone detection routine executable by the host processor for processing the stream of digital sample values representative of the incoming signal to detect the presence of an answer tone received over the communications link.

49. (New) A system as claimed in claim 48, wherein the answer-tone detection routine is stored in the memory.

50. (New) A system as claimed in claim 40, wherein the incoming signal represents graphical data.

51. (New) A system as claimed in claim 40, wherein the outgoing signal represents graphical data.

52. (New) A computer-readable medium having stored thereon instructions executable by a host processor of a computer to cause the host processor to perform functions comprising:

interpolating a stream of digital sample values representative of a communication from a remote device, so as to compensate for baud rate variation between the computer and the remote device, and to thereby provide an interpolated stream of digital sample values;

demodulating the interpolated stream of digital sample values, so as to provide a stream of digital input data; and

modulating a stream of digital output data, so as to provide a stream of digital sample values representative of a communication to the remote device.

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53. (New) A computer-readable medium having stored thereon instructions defining a plurality of routines executable by a host processor of a computer, the routines comprising:

an interpolation routine executable by the host processor to interpolate a stream of digital sample values representative of a communication from a remote device, so as to compensate for baud rate variation between the computer and the remote device and to thereby provide an interpolated stream of digital sample values;

a modem demodulation routine executable by the host processor to demodulate the interpolated stream of digital sample values, and to thereby provide a stream of digital input data; and

a modem modulation routine executable by the host-processor to modulate a stream of digital output data, and to thereby provide a stream of digital sample values representative of a communication from the computer.

54. (New) In combination with a computer of the class comprising a processor, a memory, a system bus composed of conductors interconnecting at least the processor and the memory, an auxiliary circuit for communicating between the computer and a remote device via a communications link, the remote device operating at a remote baud rate, the auxiliary circuit comprising:

interface circuitry connectable to the communications link for (i) receiving from the communications link an incoming signal representative of a communication from a remote device and (ii) delivering to the communications link an outgoing signal representative of a communication from the computer;

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an interpolation routine executable by the processor to interpolate a stream of digital sample values representative of the incoming signal so as to compensate for baud rate variation and to thereby provide an interpolated stream of digital sample values;

a modem demodulation routine executable by the processor to demodulate the interpolated stream of digital sample values, and to thereby provide a stream of digital input data; and

a modem modulation routine executable by the processor to modulate a stream of digital output data, and to thereby provide a stream of digital sample values representative of the outgoing signal.

55. (New) An auxiliary circuit as claimed in claim 54, wherein the interface circuitry includes conversion circuitry for converting the incoming signal into the stream of digital sample values representative of the incoming signal, at a sampling rate synchronized with a local clock signal.

56. (New) An auxiliary circuit card comprising the auxiliary circuit of claim 54, the auxiliary circuit card being connectable to the system bus.

57. (New) An auxiliary circuit as claimed in claim 54, wherein the interface circuitry includes a hybrid circuit having a bidirectional port for receiving the incoming signal and for delivering the outgoing signal.

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58. (New) An auxiliary circuit as claimed in claim 54, wherein the interpolation routine, the modem demodulation routine and the modem modulation routine are stored in the memory.

59. (New) An auxiliary circuit as claimed in claim 54, wherein the interpolation routine, the modem demodulation routine and the modem modulation routine each comprise, respectively, a set of machine language instructions executable by the processor.

60. (New) An auxiliary circuit as claimed in claim 54, wherein the interpolation routine is executable by the processor to compensate for timing difference between sample rates of the computer and the remote device.

61. (New) An auxiliary circuit as claimed in claim 54, further comprising a tone-dialing routine executable by the processor for generating a sequence of outgoing digital sample values representing a sequence of dual-tone signals for establishing a dial-up connection with the remote device.

62. (New) An auxiliary circuit as claimed in claim 61, wherein the tone-dialing routine is stored in the memory.

63. (New) An auxiliary circuit as claimed in claim 54, further comprising an answer-tone detection routine executable by the processor for processing the stream of digital sample

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values representative of the incoming signal to detect the presence of an answer tone received over the communications link.

64. (New) An auxiliary circuit as claimed in claim 63, wherein the answer-tone detection routine is stored in the memory.

65. (New) A auxiliary circuit as claimed in claim 54, wherein the incoming signal represents graphical data.

66. (New) A auxiliary circuit as claimed in claim 54, wherein the outgoing signal represents graphical data.

67. (New) A method of communicating in real-time between a computer and a remote device, the computer having a host-processor and a memory, the remote device operating at a remote baud rate, the method comprising, in combination:

the host-processor executing a set of machine language instructions to interpolate a stream of digital sample values representative of a communication from the remote device, so as to compensate for baud rate variation and to thereby provide an interpolated stream of digital sample values;

the host-processor executing a set of machine language instructions to demodulate the interpolated stream of digital sample values, so as to provide a stream of digital input data; and

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the host-processor executing a set of machine language instructions to modulate a stream of digital output data, so as to provide a stream of digital sample values representative of a communication to the remote device.

68. (New) A method as claimed in claim 67, further comprising, in combination:

when the communication from the remote device represents a voice signal, the host-processor executing a set of machine language instructions to provide a set of outgoing digital sample values representative of an acknowledgement signal and to record an incoming message received from the remote device.

69. (New) A method as claimed in claim 67, further comprising, in combination:

the host-processor executing a set of machine language instructions to generate a sequence of outgoing digital sample values representing a sequence of dual-tone signals suitable for establishing a dial-up connection with the remote device.

70. (New) A method as claimed in claim 67, wherein the host-processor executing a set of machine language instructions to interpolate a stream of digital sample values representative of a communication from the remote device, so as to compensate for baud rate variation and to thereby provide an interpolated stream of digital sample values, comprises:

the host-processor executing a set of machine language instructions to interpolate a stream of digital sample values representative of a communication from the remote device, so as to compensate for timing difference between sample rates of the computer and the remote device.

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71. (New) In a system of the type including a host computer processor, a memory, and line interface circuitry for receiving an incoming signal representing a communication from a remote device and for delivering an outgoing signal representing a communication to the remote device, the remote device operating at a remote baud rate, a method of performing modem processing, comprising:

operating the host computer processor to execute an interpolation routine, so as to interpolate a stream of digital sample values representative of the incoming signal to compensate for baud rate variation and to thereby provide an interpolated stream of digital sample values;

operating the host computer processor to execute a demodulation routine, so as to demodulate the interpolated stream of digital sample values and to thereby provide a stream of digital input data; and

operating the host computer processor to execute a modulation routine, so as to modulate a stream of digital output data and to thereby provide a stream of digital sample values representative of the outgoing signal.

72. (New) A method of performing modem processing as claimed in claim 71, wherein operating the host computer processor to execute an interpolation routine, so as to interpolate a stream of digital sample values representative of the incoming signal to compensate for baud rate variation and to thereby provide an interpolated stream of digital sample values, comprises:

operating the host computer processor to execute an interpolation routine so as to compensate for a difference in timing of sample rates of the system and the remote device.

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73. (New) In combination with a computer of the class comprising a host processor and a memory, a communication system comprising:

line interface circuitry for receiving an incoming signal from a communications link and for delivering an outgoing signal to the communications link;

an interpolation routine executable by the host processor;

a demodulation routine executable by the host processor; and

a modulation routine executable by the host processor,

whereby, (i) by executing the interpolation routine, the host processor interpolates a stream of digital sample values representative of the incoming signal so as to produce an interpolated stream of digital sample values, (ii) by executing the demodulation routine, the host processor translates the interpolated stream of digital sample values into digital input data, and (iii) by executing the modulation routine, the host processor translates digital output data into digital sample values representative of the outgoing signal.

Respectfully submitted,

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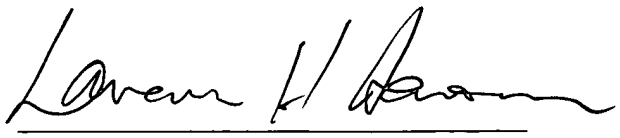
Dated: November 18, 2003

By: 

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